Supplementary Environmental Report – Response to Submissions

Lot 102 Farrall Road, Midvale

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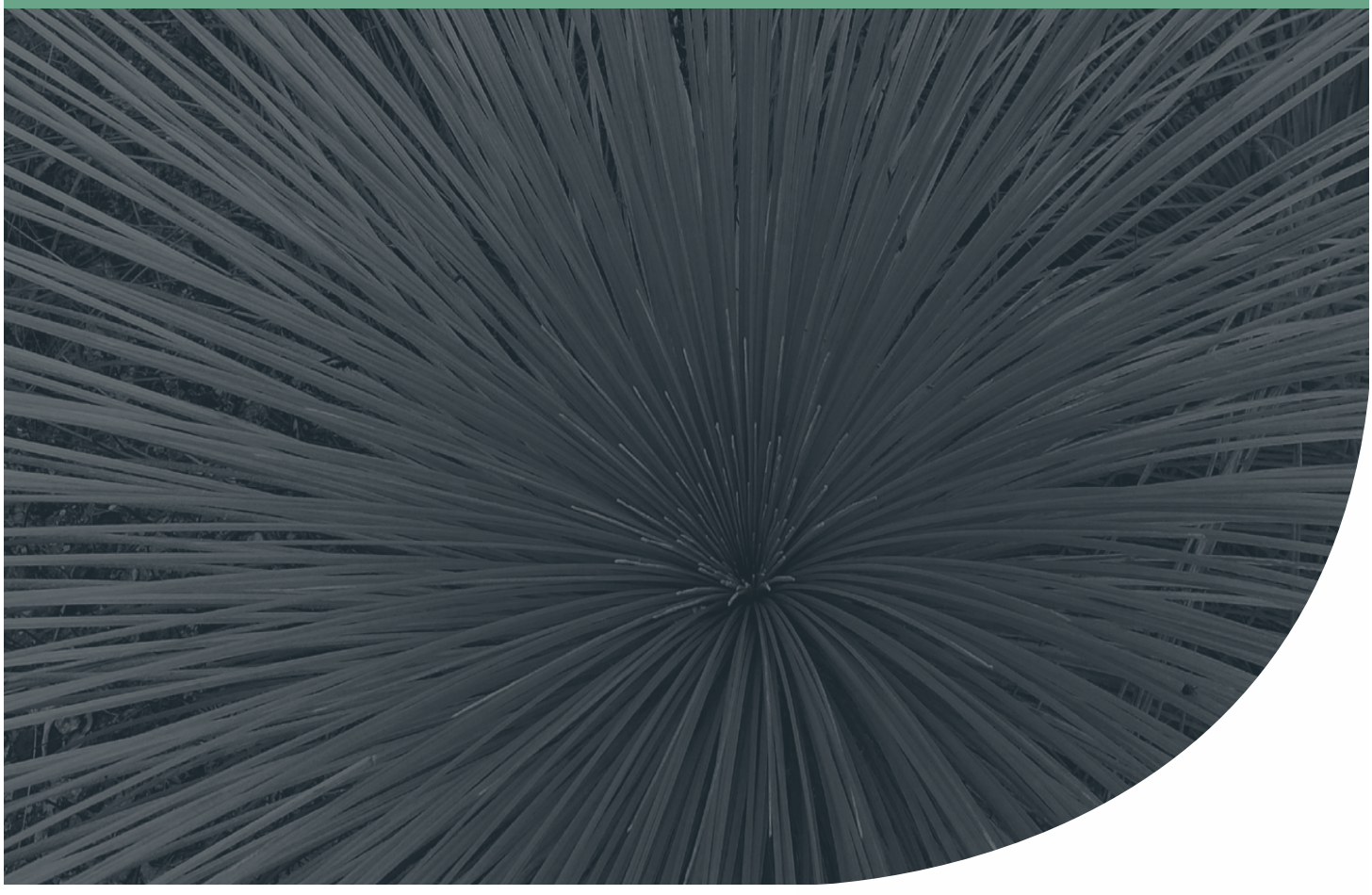

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Table of Contents

1 Introduction 1

1.1 Background 1
1.1.1 The proposal 1
1.1.2 The assessment process 1
1.2 Submissions 2
1.3 Key issues 2

2 Summary of Submissions 3

2.1 Comments from the EPA Services 3
2.2 Public Submissions 10

3 References 24

3.1 General references 24
3.2 Online references 25

List of Tables

Table 1 Summary of the proposal 1
Table 2 Comments received from EPA Services and proponent response 3
Table 3 General comments on the Proposal and proponent response 10
Table 4 Comments on Flora and Vegetation and proponent response 16
Table 5 Comments on Terrestrial Fauna and proponent response 21
Table 6 Comments on Inland Waters and proponent response 22

Figures

Figure 1: Farrall06 mapping.

Appendices

Appendix A

Regional and Local Statistics for FCT 20c TEC including Farrall05

Appendix B

Offset Assessment Guide and parameters (Strategen JBS&G 2020)

Abbreviation Tables

Table A1: Abbreviations – Organisations

Organisations	
ANZECC	Australian and New Zealand Environment and Conservation Council
DEC	Department of Environment and Conservation (now DER)
DEP	Department of Environmental Protection (now DER)
DER	Department of Environment Regulation
DIA	Department of Indigenous Affairs
DMP	Department of Mines and Petroleum
DoE	Department of Environment (now DER)
DoH	Department of Health
DoW	Department of Water
EPA	Environmental Protection Authority
NATA	National Association of Testing Authorities
NEPC	National Environmental Protection Council

Table A2: Abbreviations – General terms

General terms	
CCW	Conservation category wetland
ESA	Environmentally sensitive area
FCT	Floristic community type
IBRA	*Interim Biogeographic Regionalisation of Australia*
MUW	Multiple use wetland
NVIS	National Vegetation Inventory System (ESCAVI 2003)
P1	Priority 1
P2	Priority 2
P3	Priority 3
P4	Priority 4
P5	Priority 5

Table A2: Abbreviations – General terms (continued)

General terms	
PEC	Priority Ecological Community
REW	Resource enhancement wetland
T	Threatened
TEC	Threatened ecological community
UFI	Unique feature identifier

Table A3: Abbreviations –Legislation

Legislation	
CS Act	Contaminated Sites Act 2003
EP Act	Environmental Protection Act 1986
EPP	Environment Protection Policy
WSL Act	Water Services Licence Act

Table A4: Abbreviations – units of measurement

Units of measurement	
cm	Centimetre
ha	Hectare
m	Metre
m^2	square metre
m AHD	m in relation to the Australian height datum
mm	Millimetre

1 Introduction

1.1 Background

1.1.1 The proposal

Peet Stratton Pty Ltd (the proponent or Peet) propose to subdivide and develop Lot 102 Farrall Road, Midvale (herein referred to as 'the site') for residential uses as part of the broader Movida urban development (**Table 1**). This proposed development is in accordance with the Farrall Road Local Structure Plan No. 42 (LSP) which incorporates the site (and wider area of the Movida urban development) and was approved by the Western Australian Planning Commission (WAPC) in September 2016.

Table 1 Summary of the proposal

Item	Details
Proposal Title	Urban development of Lot 102 Farrall Road, Midvale
Proponent name	Peet Stratton Pty Ltd
Short description	Peet Stratton propose to develop Lot 102 Farrall Road, Midvale (8.298 ha) for residential uses in accordance with the Farrall Road Local Structure Plan No. 42. The development includes roads, residential lots, public open space areas and associated infrastructure.

1.1.2 The assessment process

The proposal was referred to the Environmental Protection Authority (EPA) pursuant to Section 38 of the *Environmental Protection Act 1986* (EP Act) in September 2017. The EPA determined that the proposal would be assessed by the EPA and set the level of assessment as 'Assessed on referral information with Additional Information (2-week public review)' in May 2018. The EPA identified the following factors relevant to the environmental assessment of the proposal:

- Flora and vegetation
- Fauna
- Inland waters.

The proposed action was referred pursuant to the EPBC Act in November 2017. It was determined that the proposed action was a 'Controlled Action' (EPBC 2017/8066) in July 2018 due to the expected impacts to Matters of National Environmental Significance (MNES) listed under Section 18 and 18A. As outlined in a letter to the proponent dated 2 July 2018, the relevant MNES for this proposed action is:

- Shrublands and woodlands of the eastern swan coastal plain (FCT 20c TEC).

The proposed action was also authorised to be assessed under the WA assessment process and is being assessed through an accredited assessment under section 87 of the EPBC Act.

A Supplementary Environmental Report (SER) was prepared to describe and assess the significance of any environmental impacts that have the potential to occur as a result of implementing the proposal.

This SER was based upon an additional information request received by Department of Water and Environmental Regulation (DWER) EPA Services Division on 12 October 2018.

Following additional comment from EPA Services in 31 January 2020, the SER was publicly advertised on 23 March 2020 for two weeks.

1.2 Submissions

This document forms a summary of public submissions and advice received regarding the Supplementary Environmental Review (SER) document for the Lot 102 Farrall Road, Midvale proposed by Peet Stratton Pty Ltd. This document also provides the proponents responses to these submissions.

The public review period for the proposal commenced on 23 March 2020 for a period of 2 weeks, ending on 6 April 2020. The SER was made available in public libraries, and available for download on the EPA and Peet website and was mailed to key stakeholders.

A total of 4 public submissions were received, including submissions from:

- Blackadder Woodbridge Catchment Group
- Urban Bushland Council
- 2 additional public submissions.

EPA Services' comments on the SER were also provided to the proponent. EPA Services has collated all submissions and produced a consolidated summary. The proponent was requested to respond to the submissions summary, and was provided copies of the original submissions for context.

This response to submissions document summarises the submissions and the proponent's responses to the issues raised during the submissions.

1.3 Key issues

The key issues raised in the submissions include:

- The consistency of the proposal with the principles of the EP Act and EPA objectives
- The loss of FCT 20c and other native vegetation
- The consistency of the proposal with the approved conservation advice for FCT 20c TEC (DoEE 2017)
- The retention of all FCT 20c TEC patches and appropriate buffers
- The loss of black cockatoo habitat.

2 Summary of Submissions

The proponent's responses to the EPA Services comments are provided in **Table 2**. Responses to public submissions are provided over four tables, being general comments on the proposal (**Table 3**), comments on flora and vegetation (**Table 4**), comments on terrestrial fauna (**Table 5**) and comments on inland waters (**Table 6**).

2.1 Comments from the EPA Services

Table 2 provides comments received from the Department of Water and Environmental Regulation's EPA Services Division regarding the SER for the proposal and also provides the proponent's response.

Table 2 Comments received from EPA Services and proponent response

EPA Services comment	Proponent response
Flora and Vegetation	
The Supplementary Environmental Review Document (SER) discusses the condition rating and viability of Floristic Community Type (FCT) 20c occurrences in Lot 102, and in doing so has determined that Farrall 05 is not an occurrence of FCT 20c. This is based on the Threatened Ecological Community (TEC) Review by van Etten (2019). The scope for the TEC Review (van Etten 2019) was not to consider whether or not FCT 20c are true occurrences, but to determine the long term viability of the occurrences and restoration effort. Subsequent calculation of area of impacts have therefore excluded this occurrence. Please provide calculations including Farrall 05 for the area/s of impact; cumulative impacts, State Environmental Offsets and Matters of National Environmental Significance (MNES).	As outlined in the SER, Farrall05[1] was excluded due to the small size of the patch (300 m^2) and it's degraded condition, which was supported by the independent TEC assessment (van Etten 2019). Nevertheless, Farrall05 has been included in the below calculations to re-frame the impacts and mitigation associated with the inclusion of this patch. The inclusion of Farrall05 results in the following changes: • 0.77 ha of FCT 20c TEC within the site (instead of 0.74 ha) • 0.23 ha of FCT 20c TEC within the site potentially impacted by the proposal (instead of 0.2 ha), which is 30 % of the TEC within the site (instead of 27 %). • The TEC present within the site represents less than 0.6 % of the entire known AOO (no change) • The TEC within the site that is potentially impacted by the proposal is 0.18 % of the entire known AOO (instead of 0.15 %)

[1] Note: the terminology Farrall05 is used within the document, however the SER referred to Farrell05 as this was how the original patches were referenced by DBCA.

Table 2 Comments received from EPA Services and proponent response (continued)

EPA Services comment	Proponent response
	Local and regional impacts Table 16 with the SER documented the extent of FCT 20c TEC regionally and locally and the impact of the proposal. Farrall05 has been included within these calculations and is provided in **Appendix A** (Table A1). Table A1 within **Appendix A** demonstrates that removal of 0.23 ha within the disturbance footprint is 0.32 % of the TEC within 20 km of the site and 0.18 % of the entire known TEC extent. With the inclusion of Farrall05 the impact of the proposal is less than 0.5 % of the remaining extent at both the local scale and regional scale and therefore it is considered that this impact is not a significant residual impact. Cumulative impacts As outlined in the SER, the majority of FCT 20c TEC is under the tenure or management of the Crown, State or local government. However, there is some uncertainty around the long-term retention of the 'Stirling Crescent' and 'Clifford Road' sites which are both in ownership of Main Roads and located adjacent to major road infrastructure. While the proponent is not aware of any active proposals associated with these sites, these two FCT 20c TEC sites could be subject to future impacts. Removal of FCT 20c TEC within the 'Clifford Road' and 'Stirling Crescent' sites plus implementation of the proposal would lead to a reduction in the extent of FCT 20c TEC by 7.70 ha. This is a 6 % reduction in the extent of the FCT 20c TEC community (instead of 5.9 % excluding Farrall05). The *Approved Conservation Advice for Shrublands and Woodlands of the eastern Swan Coastal Plain (DoEE 2017)* 'states that all areas of the ecological community are critical to its survival' and as such, it is considered that this 6 % reduction would be a significant impact. The proposal would only contributes 0.18 % of this 6 % reduction and therefore a minimal contribution. Any removal of FCT 20c TEC within 'Clifford Road' and 'Stirling Crescent' is likely to require appropriate avoidance and mitigation which may reduce the overall impact. State Environmental Offsets The *WA Environmental Offsets Guidelines* (Government of WA 2014) states that 'mitigation includes the effect of onsite rehabilitation in rectifying the impact of a project once complete'. As part of the proposal, rehabilitation of FCT 20c TEC will occur as part of implementation of the proposal and it is the intention that 0.98 ha of banksia woodland similar to FCT 20c TEC will be created in the long term, including the retention of 0.54 ha currently in 'good' condition. This is an increase of 27 % (instead of 32 %) in the area of TEC that is currently present within the site.

Table 2 Comments received from EPA Services and proponent response (continued)

EPA Services comment	Proponent response
	It is considered that given the proposed onsite rehabilitation there is no significant residual impact and no state environmental offset is required. MNES The offset assessment guide FCT 20c TEC offsets for both protection of retained vegetation and revegetation including Farrall05 is provided in **Appendix B**. The offset parameters used in the offset assessment guide have been provided within Table B1 of **Appendix B** for the protection of retained vegetation and Table B2 of **Appendix B** for the revegetation offsets. Using the values indicated in Table B1 of **Appendix B**, the output from the offset calculations indicate that 146.42 % of the residual impact will be offset by the proposed protection of retained vegetation (instead of 168.3% if Farrall05 is excluded). Using the values within Table B2 of **Appendix B** the offset calculations indicate that 83.49 % of the residual impact will be offset by the proposed revegetation (instead of 96.02% if Farrall05 is excluded). In total, the proposed protection or retained vegetation and revegetation offsets will offset 229.91% of the residual impact (instead of 264.4% if Farrall05 is excluded).
The extent of Farrall 06 mapping by DBCA is 0.48ha. The SER advises detailed mapping by Emerge considers the extent to be 0.54 ha. Please provide the justification and (survey) information to demonstrate and support this revision. Alternately, recalculate the area/s of impact; cumulative impacts, State Environmental Offsets and MNES.	As outlined in the SER, Emerge completed detailed mapping of Farrall06 to refine the patch size and to inform future revegetation requirements. **Figure 1** provides a comparison between the DBCA and Emerge mapping. From this figure, it is clear that Emerge's mapping follows the vegetation boundary of the plant community and is based upon site-specific observations and high-resolution aerial photography. It is unclear how the DBCA mapping is derived but may be based upon lower resolution aerial photography or GPS points.

Table 2 Comments received from EPA Services and proponent response (continued)

EPA Services comment	Proponent response
The SER proposes a TEC buffer of 25m and states that there is no explicit policy or guideline that requires or recommends buffers to TECs. A buffer distance should be determined based on on-ground survey for condition, weed species/density and analysis of this data. The '*Approved Conservation Advice for Shrublands and Woodlands of the eastern Swan Coastal Plain' (*Conservation Advice) recommends buffers of at least 20-50m. The Guidance note – Modification of an occurrence of a threatened ecological community (DBCA, 2019) provides advice that buffers should be determined on a case by case basis. Considering the relatively small size of Farrall 06, its susceptibility to degrading processes, and the reduced buffer due to a proposed path, provide information to support the proposed buffer. Buffer studies for similar FCT's may be relevant to consider in this context.	We acknowledge that the *Approved conservation advice for the shrublands and woodlands of the eastern Swan Coastal Plain* (DoEE 2017) recommends buffers of at least 20-50m. This advice also states '*native vegetation buffers are preferred*'. A native vegetation buffer will be achieved by the proposal, where the intention is to restore the 25 m buffer from 'degraded' and 'completely degraded' condition to 'good' condition over a period of 5 to 7 years. Furthermore, the conservation advice states that '*wider buffers may be required where there is a larger scale landscape change, for example hydrological modifications*'. As outlined in the Section 4.4 of the SER, the proposal does not propose significant hydrological modification or other landscape scale change to the southern POS area (encompassing the TEC) and therefore a wider buffer is not deemed to be required. While Farrall06 is small (0.54 ha), it is the largest patch of FCT 20c TEC within the site and the area of vegetated buffer proposed is over 0.4 ha, which is 75 % of the entire patch size. This FCT 20c TEC patch is also adjacent to a wetland and combined with this wetland provides a larger area (2.64 ha) of POS to be managed for conservation. This larger area and the generally round shape of the POS makes it is less susceptible to edge effects, including weed invasion. Weed invasion is recognized as the key threat to the future viability of any patch of FCT 20c TEC, as acknowledged in the SER and the independent TEC assessment (van Etten 2019). The implementation of the proposal will remove one of the key threats to the retained FCT 20c TEC patch, as it will remove the large area of weeds currently present within the portion of the site proposed for urban development. While urban development will introduce plant species in gardens, these are not expected to be as invasive as the current invasive weedy species present within the site and any garden escapees are likely to be managed through the ongoing management of the City of Swan. The area of FCT 20c TEC buffer is currently in 'degraded' to 'completely degraded' condition and while weed species and density surveys may be relevant for unmanaged buffers, this is not considered as significant for the proposal given: • The FCT 20c TEC patch, buffer area and adjacent wetland will be subject to weed control and revegetation over at least 3 years. • The FCT 20c TEC patch, buffer area and adjacent wetland will be subject to ongoing management (including additional weed control if required) for an additional 2-4 years. • The southern POS area (including the buffer) will be managed by the City of Swan in the long term.

Table 2 Comments received from EPA Services and proponent response (continued)

EPA Services comment	Proponent response
	It is considered that a 25 m buffer is adequate to protect the TEC from significant threats, such as weeds and rubbish. A 25 m buffer was recommended as the minimum buffer size by van Etten (2019) and was based upon 'observations of weed invasion into Banksia woodland' (van Etten 2019). As outlined above, it is anticipated that weed invasion will be significantly reduced within the buffer due to urban development outside of the southern POS area and ongoing weed control within the southern POS area. A larger buffer would provide an increased management burden on the City of Swan in the longer term and therefore it is considered that 25 m (plus ongoing management) provides an adequate buffer to protect the TEC from threats (weeds, rubbish, fire etc…) while also minimising the management burden on the future conservation land manager. The path proposed within the buffer is based upon an existing cleared area and pathways are an acceptable feature within buffers. The pathway also provides a firebreak around the TEC area which will provide access in the event of a fire, plus provide access for restoration activities.
For the purposes of rehabilitation, testing of soil proposed to be transferred to the rehabilitation area would ensure there is a bank of native seed that will germinate and provide information about the quantity of weed seed.	Direct vegetation transfer involves the transfer of all vegetation material, inclusive of vegetation, soil, fungi, invertebrates, soil microbes etc… Because of the wide variety of organisms that may be relocated, direct vegetation transfer can result in superior restoration outcomes than could be achieved by planting and seeding alone (Rodgers *et al.* 2011). The transfer is immediate from the donor site to the recipient site and eliminates the need to consider storage or stockpile viability of any stored seed. Given these benefits, the viability of native seed is less relevant as it is anticipated that the benefits to the local environment will extend beyond seed viability or seed gemination rate. Should the direct vegetation transfer have limited germination, the proposal includes extensive traditional rehabilitation (i.e. planting of native tubestock) to supplement the direct vegetation transfer. Likewise, any revegetation will benefit from the existing soil biology within the direct vegetation transfer area. The direct vegetation transfer will occur from the most intact areas of FCT 20c TEC within Farrall03, Farrall04 and Farrall05. Vegetation will also only be transferred into areas within the 'degraded' portions proposed for intensive rehabilitation. In addition, the proposal includes active weed management following any direct vegetation transfer. This is an appropriate response to the potential for the transfer of weeds as part of mitigation and offset measures, including the transfer of any weed seed that may occur as part of direct vegetation

Table 2 Comments received from EPA Services and proponent response (continued)

EPA Services comment	Proponent response
	transfer. The weed management is proposed for a minimum of five years which is sufficient period of time to demonstrate efficacy of control.
Terrestrial Fauna	
According to the Fauna Assessment (Harewood, 2018), the Marri woodland, which represents high quality black cockatoo foraging habitat, should be retained. The SER states that 2.74ha of foraging habitat including the 0.2ha of Marri woodland will be removed, and 11 habitat trees. Contrary to this, the SER then states that the highest quality area of fauna habitat will be retained, which does not include the Marri woodland. Please review the proposed mitigation and avoidance accordingly, including consideration of the retention of higher quality foraging habitat and/or additional habitat trees.	The highest quality fauna habitat is considered to be the area of site that provides the greatest value for the highest number of native fauna species. This is considered to be within the southern POS area, given this area contains: • Areas of the highest vegetation condition (often used as a proxy for fauna habitat) • A variety of fauna habitats, including wetland and dryland woodland. As outlined in the SER, these areas are likely to provide a local refuge site for several fauna species such as small mammals (including Quenda), frogs and waterbirds. The southern POS area will also provide some foraging habitat for Carnaby's black cockatoos. The 0.2 ha marri woodland (plant community Cc) would provide 'high quality' foraging habitat for the Forest red-tailed black cockatoo and Baudin's black cockatoo. However, the overall fauna value for this area is low, given there is minimal understorey and the vegetation is in 'degraded' condition. While 11 habitat trees will be removed as part of the implementation of the proposal, these trees are scattered across the site and are not surrounding by quality habitat. No roosting was recorded in these trees and the trees do not include suitable hollows for black cockatoo species for breeding (Harewood 2018). As such they are not considered to provide important habitat value for black cockatoo species. It is not considered that the proposal will significantly impact on black cockatoo species, given that less than 0.1% of local habitat (within 6km of the site) will be impacted by the proposal (as outlined in Table 26 of the SER). Furthermore given black cockatoo species are highly mobile, any impacts to these species is considered indirect, as the species would be able to utilise areas of high-quality habitat within the local area, including large areas of habitat within Talbot Road Reserve and John Forrest National Park to the east. This is supported by the fact that the federal Department of Water, Agriculture and Environment did not identify black cockatoo as a significant matter in their assessment of the referral.

Table 2 Comments received from EPA Services and proponent response (continued)

EPA Services comment	Proponent response
As no Short Range Endemic (SRE) surveys have been undertaken, there is no evidence to support the assumptions that the proposed mitigation (rehabilitation) and retained areas (avoidance) will provide the stated benefits to SREs. SRE surveys within areas of the proposed southern Public Open Space (POS) management area, to inform the design and implementation of the rehabilitation, and to provide best-possible outcomes for SRE species, should be undertaken to inform design and implementation of the proposed rehabilitation.	Any requirement for SRE field survey is guided by the *Technical Guidance: Sampling of short range endemic invertebrate fauna* (EPA 2016). This guidance states that 'the EPA expects initial assessments to provide a review of the potential for SRE fauna to occur, especially if these are used to justify a risk-based argument for not proceeding to field survey. Field sampling will be expected where high levels of uncertainty remain, or the WA Museum or the DEC advise that field survey is still required'. Appendix G of the SER contained a desktop assessment for SRE fauna (Invertebrate Solutions 2019) which concluded that a field survey was not required to meet the EPA technical guidance, given the small size of the site and that the majority of vegetation that is not degraded will be conserved and preserved and as such there are unlikely to be any significant impacts on any SRE or conservation significant invertebrate species. On this basis, the proponent adopted a risk-based approach in accordance with the technical guidelines. The SER was finalised on this basis and the proponent has not received any comment through the referral and assessment process that field survey would be required to understand the extent or significance of impacts on SRE potentially arising from the implementation of the proposal. It is considered that there are not 'high levels of uncertainty' which would warrant a field survey. In addition, the proposed treatment and management of the southern POS area has been driven by the location of the wetland and the TEC with an appropriate buffer. Given the vegetation is a TEC, the approach is a very careful and considered one involving the retention and enhancement of all existing vegetation and natural fauna habitats. The presence/absence of SRE would not affect this approach for the southern POS area. Proposed access around and through the POS will be located on existing tracks and outside of potential SRE habitat. Furthermore, the proposed mitigation (rehabilitation) is unlikely to be altered given the presence of SRE species. Best practice rehabilitation for SRE species would involve: • Protection of the existing potential SRE habitat within the site, which is confirmed to be the areas proposed for retention and conservation management. • Minimising disturbance to intact areas of native vegetation. Any rehabilitation in these more intact areas would be focussed on weed removal and any impacts to potential SRE habitat would be minimised, including a limited use of machinery. • Planting of native vegetation in degraded areas consistent with plant species present within the site, including ground and mid-storey vegetation. While this revegetation will be intensive (in terms of ground-disturbance), it is not considered to have a significant impact on SRE as the likelihood that any species are present within these degraded areas is low. • Fencing and limiting of public access. These activities will be facilitated by the proposal.

Table 2 Comments received from EPA Services and proponent response (continued)

EPA Services comment	Proponent response
	As such, the proponent does not believe a field survey is required to support the design or rehabilitation of the southern POS area, as the outcome of the survey would not alter the proposed approach. In addition, the desktop assessment has concluded that a field survey is not required and impacts to SRE fauna are unlikely to be significant.
It is noted an Urban Water Management Plan will be prepared on advice of DBCA. Further information will be required: a) Details on monitoring bores, specifically within the southern POS area. b) Details on proposed monitoring of pre-development water levels up-gradient of the wetland, as well as collection of local site specific hydrological data, to ensure the soil-water and groundwater recharge, and local flow regimes, are maintained post – development/rehabilitation. The data could be used to update and refine the water balance, and ensure soil moisture levels within and up-gradient of the wetland are maintained.	A UWMP will be prepared as a condition of subdivision for the site and it is anticipated this will be to the satisfaction of the City of Swan on the advice of DWER and DBCA. In accordance with the comment raised by EPA services, this UWMP will include: • details on monitoring bores within the southern POS area. • details on monitoring of pre-development water levels upgradient of the wetland through the installation of four groundwater monitoring bores (to be installed outside of the TEC and wetland area). o These monitoring bores will record pre and post development groundwater levels. o Results of pre-development monitoring can be used to refine the water balance. • local site-specific hydrological data from geotechnical investigations including installation of test pits or boreholes (installed outside of the TEC and wetland area) and may include infiltration or permeability testing.

2.2 Public Submissions

Table 3 General comments on the Proposal and proponent response

No.	Submitter	Submission and/or issue	Proponent response
1	ANON-T9P7-7KZD-M Blackadder Woodbridge Catchment Group	Proposal does not meet first three principles as set out in Section 4A of the EP Act.	The first three principles of Section 4A of the EP Act are discussed below. ***1. The precautionary principle*** *Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In application of this* *precautionary principle, decisions should be guided by:* *a. careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and* b. *an assessment of the risk-weighted consequences of various options.* The proponent has undertaken extensive survey of the site and it is considered there is adequate scientific certainty regarding the location and extent of FCT 20c TEC.

Table 3 General comments on the Proposal and proponent response (continued)

No.	Submitter	Submission and/or issue	Proponent response
			This has been further supported by the independent TEC assessment undertaken by van Etten (2019). While the proposal will cause the removal of patches of TEC it is considered that the proposed avoidance (through retention of Farrall06) plus the mitigation measures proposed provide an overall lower risk to the long term retention of the TEC than the 'do nothing' scenario. As outlined in the SER the northern patches of FCT 20c TEC would likely be unviable over the long term, given persistent threats, edge effects, lack of connectivity to other intact FCT 20c TEC remnants (van Etten 2019). Without the control of weeds, the patches are likely to transition to a grassy weed dominated open woodland/shrubland ecosystem which would be structurally and functionally different from that of FCT 20c TEC and similar to that which exists over the majority of the site (van Etten 2019). The retention and revegetation of the smaller northern patches, plus an appropriate buffer would require significant expenditure of resources and an unreasonable management burden on the future landowner, given the area of the buffer than the area of FCT 20c TEC vegetation being retained. As such, it is considered that the proposal provides a more certain outcome for the long-term retention of FCT 20c TEC, through a commitment to revegetation and then long-term ongoing management. ***2. The principle of intergenerational equity*** *The present generation should ensure that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations.* While, the proposal will result in the removal of areas of native vegetation including patches of FCT 20c TEC, the implementation of the proposal provides the opportunity for significant environmental values within the site, such as the Bush Forever Site, a wetland and FCT 20c TEC to be improved through revegetation, transferred to the Crown and managed in the long term for conservation with input from the community. These environmental values are currently in private ownership, with no ongoing maintenance and no formal public access. In line with the principle of intergenerational equity, the implementation of the proposal will enhance, provide ongoing maintenance, and provide future generations with the ability to access and contribute to the management and appreciation of these areas.

Table 3 General comments on the Proposal and proponent response (continued)

No.	Submitter	Submission and/or issue	Proponent response
			3. The principle of the conservation of biological diversity and ecological integrity *Conservation of biological diversity and ecological integrity should be a fundamental consideration.* A number of studies have been undertaken to understand the presence of flora, vegetation and fauna values within the development envelope and surrounding area. These studies have been used to refine the proposal and it has been determined that with appropriate design and the preparation of management plans, including revegetation of the southern POS area that no significant residual environmental impacts will occur from implementation of the proposal. The proposal will provide for biological diversity and ecological integrity through the long term management of a conservation POS area with secure tenure. The conservation POS area includes the most biologically diverse area of the site, including wetland and dryland plant communities. In addition, the proposed use of vegetation direct transfer within the proposal intends to assist in the conservation of biological diversity, to allow areas of FCT 20c TEC to be directly transferred to the conservation area.
2	ANON-T9P7-7KZ1-1 Urban Bushland Council of WA	Proposal does not meet EPA objectives for Flora and Vegetation, Fauna and Inland Waters.	The EPA objectives for Flora and Vegetation, Fauna and Inland Waters are discussed below. ***Flora and Vegetation*** *EPA objective – to protect flora and vegetation so that biological diversity and ecological integrity are maintained.* While the proposal will result in the clearing of native vegetation, the mitigation measures proposed will provide for the retention of biological diversity and ecological integrity. The site is currently unmanaged and subject to ongoing threats, from weeds, rubbish and fire. Over time this would reduce the biological diversity and ecological integrity of the site. The proposal provides an opportunity to mitigate and managed these threats with the retention of the largest patch of FCT 20c TEC and a wetland. Improvements through weed control and revegetation within the southern POS area will increase the resilience and maintain the biological diversity and ecological integrity of these areas. The proposal also provides for the secure tenure and ongoing management for the areas of retained flora and vegetation in the long term.

Table 3 General comments on the Proposal and proponent response (continued)

No.	Submitter	Submission and/or issue	Proponent response
			Fauna *EPA objective – to protect terrestrial fauna so that biological diversity and ecological integrity are maintained.* While the proposal will result in the clearing of fauna habitat, the mitigation measures proposed will provide for the retention of biological diversity and ecological integrity. Most areas of the site lack any natural fauna habitat and are now only utilised by generally common and widespread fauna species with non-specific requirements which allow them to persist in highly disturbed habitats (Harewood 2014) The proposal aims to retain the highest quality fauna habitat, that is the area that provides the greatest value for the highest number of native fauna species. This is considered to be within the southern POS area, given this area contains: • Areas of the highest vegetation condition (often used as a proxy for fauna habitat) • A variety of fauna habitats and biological diversity, including wetland and dryland woodland. The proposal will provide for the retention of these areas in the long term and aim to improve the ecological integrity and resilience of these areas through weed control and revegetation. While the proposal will result in the removal of some areas of black cockatoo habitat, including 2.74 ha of black cockatoo habitat and 11 black cockatoo habitat trees, these impacts are not considered significant given: • Less than 0.1% of local habitat (within 6 km of the site) will be impacted by the proposal (as outlined in Table 26 of the SER) (*Carnaby's cockatoo (Calyptorhynchus latirostris) spatial data for Swan Coastal Plain and Jarrah Forest IBRA regions* (DEC 2011). • No roosting was recorded within these trees and the trees do not include suitable hollows for black cockatoo species for breeding • The habitat trees are scattered within the site and are not surrounded by quality habitat. Furthermore given black cockatoo species are highly mobile, any impacts to these species is considered indirect, as the species would be able to utilise areas of high-quality habitat within the local area, including large areas of habitat within Talbot Road Reserve and John Forrest National Park to the east. An area of 0.85 ha of Carnaby's foraging habitat will be retained and protected within the southern POS area which will assist in the retention of biological diversity within the site.

Table 3 General comments on the Proposal and proponent response (continued)

No.	Submitter	Submission and/or issue	Proponent response
			Inland Waters *EPA objective – to maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.* The proposal will involve urban development of a portion of the site. The hydrological regime and groundwater and surface water quality of the site are not expected to be significantly impacted. The water balance for the wetland prepared for the SER (Plate 13) demonstrates the following: • A 2.6 % reduction in direct rainfall and direct recharge to groundwater (due to removal of a small area of wetland dependent vegetation). • A 1.6% increase in recharge to groundwater due to the change in landuse across the site. • No change to surface water inflows or outflows to the wetland. • No change to groundwater throughflow beneath the site. On this basis, it is considered that the proposal will not significantly alter the hydrological regime of the wetland. In addition, the proposal has made a number of commitments that will aim to maintain the hydrological regime across the urban development portion of the site including: • No grading of clayey soils to maintain the sub-surface groundwater flow across the site. • Final earthworks contours will ensure the depth of cut does not intersect/divert regional groundwater and therefore maintains the existing hydrogeological regime. • The small rainfall event will be treated within lots and road reserves to maintain the hydrogeological regime that sustains the wetland and ensure pollutants generated within the site are appropriately treated. • If any future production bores are required for construction these will be installed westward of the current prosecution bore and pumping will be restricted to construction operating hours on weekdays to enable recovery of groundwater levels overnight. These measures will be documented in an UWMP prepared as a condition of subdivision, consistent with the principles and objectives of the approved LWMS (Emerge Associates 2015). Impacts to water quality associated with the urban development of the site will be managed through design and stormwater management. These measures will be outlined in UWMP which will be prepared as a condition of subdivision to the satisfaction of the City of Swan on advice of DWER and DBCA. Revegetation measures as outlined in the RVMP (Appendix J of the SER) will also aim to minimise water quality impacts through the use of slow release nitrogen fertiliser at the time of planting only.

Table 3 General comments on the Proposal and proponent response (continued)

No.	Submitter	Submission and/or issue	Proponent response
3	ANON-T9P7-7KZN-X Tauss and Associates Biodiversity Consultantsas	The submitter is concerned that the proposed development has consistently denied impacts and ignored, misrepresented/undermined the '*Approved Conservation Advice for Shrublands and Woodlands of the eastern Swan Coastal Plain'*	The proponent acknowledges the *Approved Conservation Advice for Shrublands and Woodlands of the eastern Swan Coastal Plain* (DoEE 2017) in conjunction with the historic recovery plans (English and Blyth 2000; DEC 2006). The conservation advice and the recovery plans has informed various aspects of proposal including: • The proposal design through the retention and protection of the largest patch of FCT 20c TEC within the site. • Restoration of the ecological community and surrounding buffer area within the southern POS area. • Management of ongoing threats (weeds, feral animals, fire, rubbish dumping). • Commitment to engaging with the local community regarding the retained area of TEC, including establishment of a community group to contribute to conservation management and activities. As outlined in the SER, all patches of the ecological community are critical to its survival, however currently the patches within the site are subject to ongoing threats, which can not be mitigated without significant expense and resources. As outlined in the independent TEC assessment with the ongoing degradation of the patches of FCT 20c TEC, these patches will reach a point where the description of the community does not reflect the vegetation contained within the patch and the patch can not recover from this degradation without significant intervention. The independent TEC assessment states 'Although the conservation advice for FCT 20c released by the Commonwealth states that all patches are important irrespective of condition, there is likely to be point in the degradation cycle where the community is: 1) is not recoverable even with serious intervention; and 2) no longer identifiable as that particular community as its characteristics have changed so much' (van Etten 2019). The conservation advice notes that offsets should be used as a last resort and that *'areas that already meet the condition thresholds are protected by this listing, so are not be used as an offset unless there is a substantial net conservation benefit such as a perpetual change in land tenure for conservation purposes, with ongoing threat abatement measures and monitoring put in place.'* While the proposal will reduce the extent of FCT 20c TEC locally it will provide a perpetual change in land tenure for conservation purpose, plus increase the area and ecological function of the Farrall06 patch, through revegetation and ongoing management. As such, it is considered that the proposal is aligned with the Conservation Advice.

Table 4 Comments on Flora and Vegetation and proponent response

No.	Submitter	Submission and/or issue	Proponent response
1	Blackadder Woodbridge Catchment Group	The submitters contend the proposal is not consistent with the '*Approved Conservation Advice for Shrublands and Woodlands of the eastern Swan Coastal Plain'* (Conservation Advice) particularly Section 6 and 6.2.1 as the proposal fails to achieve the objectives. Removal of Farrall 05 is not consistent with the Conservation Advice that no condition thresholds are applied and hence all areas meeting description are critical. The buffer of 25m is not sufficient. A buffer of 50m around each occurrence would result in linkage between Blackadder Creek and Bush Forever Site No. 309/southern POS, together with the Priority Ecological Community (PEC) Floristic Community Type (FCT) 21c, which should also be protected. Without an active community group assisting the City of Swan, future management of the proposed southern Public Open Space (POS) will be a failure. The group will not assist with conservation activities as the area will not be sustainable.	Section 6 of the Conservation Advice (DoEE 2017) outlines the 'Priority Conservation and Research Actions' for FCT 20c TEC Shrublands and Woodlands of the eastern Swan Coastal Plain. A number of these actions have been included within the proposal including: • Protection of a patch of FCT 20c TEC within the site • Restoration of this patch through abetment of threats, regeneration and revegetation • Community engagement through creation of a local 'friends of' group and ongoing community engagement consistent with the wider community engagement and development strategy (Creating Communities 2018). In line with the comments provided by EPA services, Farrall05 has now been included within calculations of the impact of the proposal (see **Table 2**, **Appendix A** and **Appendix B**). The SER acknowledges there are no vegetation condition thresholds for FCT 20c TEC and impacts should be avoided as outlined in the Conservation Advice (van Etten 2019), however the retention of all patches within the site, plus an appropriate buffer places an unreasonable burden on the proponent and the future land manager. While a large buffer of 50 m around all patches would provide a linkage across the site, this would result in a significant area of revegetation many times greater than the area of patches being retained. This is supported by the independent assessment (van Etten 2019) which states 'Keeping the other smaller patches of FCT 20c will be problematic given their size, condition and isolation, and the cost of implementation relative to area protected'. In the absence of this proposal (the 'do nothing' scenario), the northern patches of FCT 20c TEC would likely be unviable over the long term, given persistent threats, edge effects, lack of connectivity to other intact FCT 20c TEC remnants (van Etten 2019). Without the control of weeds, the patches are likely to transition to a grassy weed dominated open woodland/shrubland ecosystem which would be structurally and functionally different from that of FCT 20c TEC and similar to that which exists over the majority of the site (van Etten 2019) The funds generated through urban development within the northern portion of the site provide resources for the revegetation and ongoing management of the southern POS area. The proponent has actively engaged with the broader community across the wider Movida estate and local area and will continue community engagement including with future residents of Lot 102 to establish a community group to assist with conservation activities within the southern POS area. Any decision by the BWCG to not participate in future management is not expected to limit the formation of a future conservation management group for the southern POS area, which could comprise local residents.

Table 4 Comments on Flora and Vegetation and proponent response (continued)

No.	Submitter	Submission and/or issue	Proponent response
2	Urban Bushland Council of WA	The submitter contends that the proposed removal of any area of FCT 20c is critical to its survival and must be retained and protected. All occurrences are mapped by Department of Biodiversity, Conservation and Attractions (DBCA) as 'Good' condition. Removal of any occurrence is not consistent with the Conservation Advice. The advice in the Threatened Ecological Community (TEC) Review by van Etten (2019) is inconsistent with the Conservation Advice. The clearing of Forrestfield Complex which is under 10% is not consistent with policy objectives of Bush Forever.	As outlined above, the proposal includes mitigation measures to accommodate the impact of the removal of 0.23 ha of FCT 20c TEC. These mitigation measures are consistent with the objectives of the Conservation Advice (DoEE 2017) and recovery plans for FCT 20c TEC (English and Blyth 2000; DEC 2006). The proponent acknowledges the DBCA mapping of FCT 20c TEC across the site and subsequently Farrall05 has been included within the proposed impacts as outlined in **Table 2**, **Appendix A** and **Appendix B**. While there is no condition threshold or minimum patch size within the Conservation Advice, the proposal provides mitigation measures to offset significant residual impacts. Offsets are discussed within the Conservation Advice and while they should be avoided, it is considered that offsets are an appropriate mitigation response for the proposal given: • The size of the patches of FCT 20c TEC which are likely to be unviable in the long term as remnants given edge effects and current threats. • The separation between patches which makes rehabilitation and ongoing management of all patches unreasonable. • An offset will provide a net conservation benefit including a change in land tenure for conservation purposes. This is supported by the MNES offset assessment guide, which demonstrates that the proposal will offset 229.91% of the residual impact (**Appendix B**) The advice in the TEC assessment by van Etten (2019) is independent and Dr van Etten was appointed following agreement from the EPA. The Forrestfield Complex once covered 22,812ha on the Swan Coastal Plain (Government of Western Australia 2019). Today 2,803 ha (12 %) remains, with 3.4 % under some form of formal or informal protection (PBP 2013) and 1.7 % within DBCA managed land (Government of Western Australia 2019). The complex is not under the 10% remaining threshold but regardless is recommended as a priority for retention within the City of Swan *Local Biodiversity Strategy* (City of Swan 2015) and under the 30% remaining threshold as recommended for vegetation complexes (EPA 2008).

Table 4 Comments on Flora and Vegetation and proponent response (continued)

No.	Submitter	Submission and/or issue	Proponent response
3	ANON-T9P7-7KZN-X Tauss and Associates Biodiversity Consultants	The submitter contends the proposal is not consistent with the Conservation Advice as it fails to meet the main principle and the objectives. The 1.3 ha of FCT 20c in degraded condition proposed to be removed meets the definition of 'critical habitat' in the Conservation Advice. It is likely even degraded vegetation on Lot 102 could be successfully regenerated. No attempt has been made to test for the possibility of restoration of degraded areas. Rehabilitating areas of degraded condition FCT 20c and destroying good condition is nonsensical. No evidence has been provided to support a buffer of 25m. A 50m buffer should be provided around all occurrences of FCT 20c, the Bush Forever site and Banksia woodlands FCT, which would create a single large conservation area, with minimum edge effects. The TEC Review (van Etten, 2019) contains a number of flaws; failure to establish independence; lack of original data to validate conclusions; underestimation of conservation values on the site; the ecological role of surrounding vegetation and does not meet the Conservation Advice.	While the proposal does not include retention of all known patches of FCT 20c TEC within the site, it does provide improved protection and ecological integrity for the largest, most intact patch of FCT 20c TEC within the site. Furthermore, the proposal provides for restoration of areas adjacent to Farrall06 patch to provide a vegetated buffer and intends to (over time) increase the area of FCT 20c TEC. The approach is consistent with a number of the priority actions of the Conservation Advice including: • Protection of the Farrall06 patch including a buffer • Preventing weed invasion and feral animals within the retained area • Preventing dieback and other disease within the retained area • Managing groundwater within the retained area • Restoration of the retained area and surrounding buffer. • Promote awareness and community involvement. The submitter states that 1.3 ha of FCT 20c TEC in 'degraded' condition meets the definition of critical habitat in the Conservation Advice. Areas of critical habitat are defined in the Conservation Advice as '*The habitat that is critical for survival of the ecological community is the area of occupancy of known occurrences; and the sandy to gravelly soils on the eastern Swan Coastal Plain and foothills of the Darling Scarp on which the community occurs, areas of similar habitat within 200 metres of known occurrences, (i.e. sandy to gravelly soils on the eastern Swan Coastal Plain and foothills of the Darling Scarp); and remnant vegetation that surrounds or links several occurrences (this is to provide habitat for pollinators or to allow them to move between occurrences).'* In accordance with the above definition, the 1.3 ha of 'degraded' FCT 20c TEC is not considered to be within the area of occupancy of known occurrences, as it is not mapped by DBCA nor recognised in the Recovery Plans (English and Blyth 2000; DEC 2006), nor does this area form part of the sandy to gravelly soils on which the community occurs. While areas within 200 m surrounding the patches of FCT 20c TEC could be considered 'critical habitat' these areas are also the most significant threat to the viability of the patches through weed incursion and actively contribute to degradation of the remaining patches through weed invasion. These areas of critical habitat would be significantly greater than the small areas of any FCT 20c TEC patches they surrounded and are generally in 'degraded' to 'completely degraded' condition. These areas could not be restored to FCT 20c TEC without significant intervention and resources. Furthermore, given the degraded nature of these areas they are unlikely to be considered 'remnant vegetation'. As such, it is questionable whether the 1.3 ha of FCT 20c TEC meet the definition of critical habitat.

Table 4 Comments on Flora and Vegetation and proponent response (continued)

No.	Submitter	Submission and/or issue	Proponent response
		The TEC Review (van Etten, 2019) underestimates the extent of FCT 20c by nearly 51% when compared to Tauss & Associates (2016) and differs from DBCA and Emerge Associates condition assessment, without evidence. The value of adjacent vegetation was not considered, which is not consistent with the Conservation Advice.	The proposal involves the restoration of degraded areas of native vegetation surrounding the Farrall06 TEC patch. This patch was chosen for retention given it is: • The largest patch of FCT 20c TEC on the site • The best condition patch of FCT 20c TEC on the site • Adjacent to a wetland in 'excellent' condition • Generally circular in shape to minimise edge effects. • Located at the edge of the site to minimise impacts from urban development. It was therefore considered that this area was the most viable to enable the long-term retention of the TEC within the site. This view was supported by the independent TEC assessment (van Etten 2019) which states 'All patches of FCT 20c at Lot 102 are vulnerable and unlikely to survive over the long term without management given ongoing weed invasion, lack of recruitment and other threats, in combination with their size and isolation. The largest patch is potentially viable provided effective buffer, restoration and management prescriptions are applied.' As outlined in **Table 2** the *Approved conservation advice for the shrublands and woodlands of the eastern Swan Coastal Plain* (DoEE 2017) recommends buffers of at least 20-50m. The 25m buffer to be implemented as part of the proposal is in majority, native vegetation that will be restored from 'degraded' and 'completely degraded' condition to 'good' condition over a period of 5 to 7 years. It is considered that a 25 m buffer is adequate to protect the TEC from significant threats, such as weeds and rubbish. A 25 m buffer was recommended as the minimum buffer size by van Etten (2019) and was based upon 'observations of weed invasion into Banksia woodland'. Through the implementation of the proposal it is anticipated that weed invasion will be significantly reduced within the buffer due to urban development outside of the southern POS area and ongoing weed control within the southern POS area. Urban development will remove a significant source of the weed invasion within the site as unmanaged weedy areas are cleared and developed. While urban development will introduce other garden and POS vegetation into the site these are not considered as invasive as the current grassy weed species. Further urban development (and the implementation of the proposal) will provide a mechanism for ongoing management of the POS area by the City of Swan. A larger buffer would provide an increased management burden on the City of Swan in the longer term and therefore it is considered that 25 m (plus ongoing management) provides an adequate buffer to protect the TEC from threats (weeds, rubbish, fire etc…) while also minimising the management burden on the future conservation land manager.

Table 4 Comments on Flora and Vegetation and proponent response (continued)

No.	Submitter	Submission and/or issue	Proponent response
			While a large buffer of 50 m around all patches would retain a single large conservation area this would result in a significant area of revegetation many times greater than the area of patches being retained. This would create an unreasonable management burden on the future landowner and as suggested by (van Etten 2019) is a questionable return on investment. The proponent can not comment on the results of the TEC assessment but can confirm: • Dr van Etten is a member of the Western Australian Threatened Species Scientific Committee and was appointed to undertake the independent TEC assessment following confirmation of his appointment by the EPA. • Dr van Etten was selected due to his extensive experience in FCT assessment on the Swan Coastal Plain. Specifically, he is currently working on a number of projects focused on FCT 20c, has a broad knowledge of principles and practice of restoration ecology and has previous experience providing advice on Environmental Impact Assessment (EIA) including past EPA assessments. The scope of the assessment was endorsed by the EPA prior to the appointment of Dr van Etten and did not include the generation of new data as this was not deemed to be required given the previous assessments by Emerge Associates (2017), Tauss & Associates (2016) and DBCA. Given the relatively small area of the proposal, the site has intensively surveyed. This assessment was also confined to the patches of FCT 20c TEC as defined by DBCA (Farrall03 – Farrall06).
4	ANON-T9P7-7KZZ-A Friends of Blackadder Creek Reserve	The submitter contends the proposal does not meet the EPA's objectives for Flora and Vegetation. The vegetation proposed to be cleared is diverse, contiguous and a mosaic, and environmentally valuable. The proposed clearing will sever the continuous habitat linkage that currently exists and the vegetation proposed to be retained will decline due to reduced patch size and increased edge effect.	*EPA objective – to protect flora and vegetation so that biological diversity and ecological integrity are maintained.* While the proposal will result in the clearing of native vegetation, the mitigation measures proposed will provide for the retention of biological diversity and ecological integrity. The proposal provides an opportunity to retain the largest patch of FCT 20c TEC and a wetland with ongoing and active management, improving ecological integrity through revegetation, including revegetation of a buffer area. While the vegetation within the FCT 20c TEC patches is diverse, the majority of the site (>90%) is in 'degraded' and 'completely degraded' condition dominated by non-native species, such as invasive weeds with only sparse, scattered native vegetation. While the vegetation may be contiguous, the majority of it is non-native. This non-native vegetation is an active threat to the remaining flora and vegetation values of the site. The FCT 20c TEC patches in the northern portion of the site are particularly vulnerable to edge effects given their small size. The proposal will retain the largest, most intact patch of FCT 20c TEC plus a wetland within a consolidated area of conservation POS. Improvements through weed control and revegetation within the southern POS area will increase the resilience and maintain the biological diversity and

Table 4 Comments on Flora and Vegetation and proponent response (continued)

No.	Submitter	Submission and/or issue	Proponent response
			ecological integrity of these areas. The proposal also provides for the secure tenure and ongoing management for the areas of retained flora and vegetation in the long term. The urban development of the site plus the removal of weeds over 5 years by the proponent and the ongoing management will reduce the edge effects within the southern POS area. The fauna assessment found that habitat values of the site were limited and most areas lack any natural fauna habitat and are now only utilised by generally common and widespread fauna species with non-specific requirements which allow them to persist in highly disturbed habitats (Harewood 2014). The proposal is not expected to significantly reduce the habitat values of the site.

Table 5 Comments on Terrestrial Fauna and proponent response

No.	Submitter	Submission and/or issue	Proponent response
2	Urban Bushland Council of WA	Trees with >50cm DBH should be protected. The loss of habitat and potential hollow bearing trees is unacceptable.	The Black Cockatoo assessment (Appendix F of the SER) 15 trees with a Diameter at Breast Height (DBH) $\geq$ 50 cm within the site. Three of the 15 trees contained one or more hollows, however these were not considered to be suitable nesting hollows (Harewood 2018). No evidence of roosting was recorded within the site. The implementation of the proposal will result in the clearing of 11 black cockatoo habitat trees, including coastal blackbutt, marri and jarrah species. These trees would provide scattered low-quality potential roosting habitat for Baudin's black cockatoo (5 marri and 1 jarrah), Forest red-tailed black cockatoo (5 marri and 1 jarrah) and Carnaby's black cockatoo (5 marri) (DSEWPaC 2012). No roosting was recorded within these trees and the trees do not include suitable hollows for black cockatoo species for breeding (Appendix F of the SER). The habitat trees are scattered within the site and are not surrounded by quality habitat. The potential impact on habitat trees is not considered to be significant and this is supported by the fact that the federal Department of Water, Agriculture and Environment did not identify black cockatoo as a significant matter in their assessment of the referral.
4	ANON-T9P7-7KZZ-A Friends of Blackadder Creek Reserve	The proposal does not meet the EPA's objectives for Terrestrial Fauna. Removal of black cockatoo habitat will impact populations by reducing the	***Fauna*** *EPA objective – to protect terrestrial fauna so that biological diversity and ecological integrity are maintained.* While the proposal will result in the clearing of fauna habitat, the mitigation measures proposed will provide for the retention of biological diversity and ecological integrity. This is discussed further in **Table 3**.

Table 5 Comments on Terrestrial Fauna and proponent response (continued)

No.	Submitter	Submission and/or issue	Proponent response
		amount and diversity of food species that are foraged on.	Table 26 of the SER provides a summary of potential foraging habitat for Carnaby's black cockatoo using *Carnaby's cockatoo (Calyptorhynchus latirostris) spatial data for Swan Coastal Plain and Jarrah Forest IBRA regions* (DEC 2011) and demonstrates that less than 0.1 % of local habitat (within 6 km of the site) will be affected through implementation of the proposal. Furthermore given black cockatoo species are highly mobile, any impacts to these species is considered indirect, as the species would be able to utilise areas of high-quality habitat within the local area, including large areas of habitat within Talbot Road Reserve and John Forrest National Park to the east. The proposal is not expected to reduce the amount or diversity of food species that are foraged on. The plant species and vegetation removed from the site is either present locally or will be retained in the southern POS area as part of the proposal. In addition, the proposed revegetation within the southern POS will also incorporate black cockatoo foraging species.

Table 6 Comments on Inland Waters and proponent response

No.	Submitter	Submission and/or issue	Proponent response
2	Urban Bushland Council of WA	The reported depth to groundwater for the wetland and associated groundwater dependent Melaleuca woodland is contrary to DBCA's advice that the wetland is part of a large Palusplain wetland.	The SER states that the depth to groundwater ranges from approximately 8.5 m to 13.5 m below the natural surface (Section 4.4.3.4). This depth to groundwater is based upon levels outlined in the *Perth Groundwater Map* produced by the Department of Water and Environmental Regulation (DWER 2019), which is a regional scale online mapping tool. A discussion of site-specific data was outlined within the Inland Waters technical document of the SER (Appendix E). The site-specific data provides a more accurate depiction of the groundwater levels that are expected to occur within the wetland. MGL contours for the site (as shown in Figure 9 within the SER) were based on the MGL captured by GHD in July 2008 (GHD 2010). Along the western boundary of the site, MGL contours are at least 1.5 m below the surface. This site-specific data provides a more accurate depiction of the groundwater levels that are expected to occur within the wetland than the *Perth Groundwater Map* which is mapped at a regional scale. This is further confirmed by the conceptual water balance (Appendix L within the SER), which shows that the depth to groundwater (based upon within the northern portion of the wetland) ranges from 2.25 m to 1.6 m from east to west. These levels are extrapolated from geotechnical soil test pits installed by GHD in 2008 (GHD 2010) and Douglas Partners in 2014 (Douglas Partners 2014) across the wider Movida Estate.

			It is considered that this depth to groundwater is consistent with those observed for a palusplain wetland. The wetland is considered to be located within a locally perched clayey sand layer and

Table 6 Comments on Inland Waters and proponent response (continued)

No.	Submitter	Submission and/or issue	Proponent response
			consequently rainfall (that infiltrates through sands) is anticipated to perch on the surface of the underlying sandy clay layer resulting in seasonally waterlogging consistent with a palusplain wetland. These local site conditions are unlikely to be considered at a regional level (i.e. within the *Perth Groundwater Map*) which is focused on larger superficial aquifers.

3 References

3.1 General references

The references listed below have been considered as part of preparing this document.

City of Swan 2015, *Local Biodiversity Strategy*.

Creating Communities 2018, *Movida Community Development Plan*.

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Tauss & Associates 2016, *Winter Flora & Vegetation Survey: Lot 102 Farrell Rd Stratton, WA*.

van Etten, E. 2019, *Independent Study of Threatened Ecological Community, Lot 102 Farrall Road, Midvale*.

3.2 Online references

Department of Water and Environmental Regulation (DWER) 2019, *Perth Groundwater Map*, viewed 21 February 2019, https://maps.water.wa.gov.au/#/webmap/gwm

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Figures

Figure 1: Farrall06 mapping.

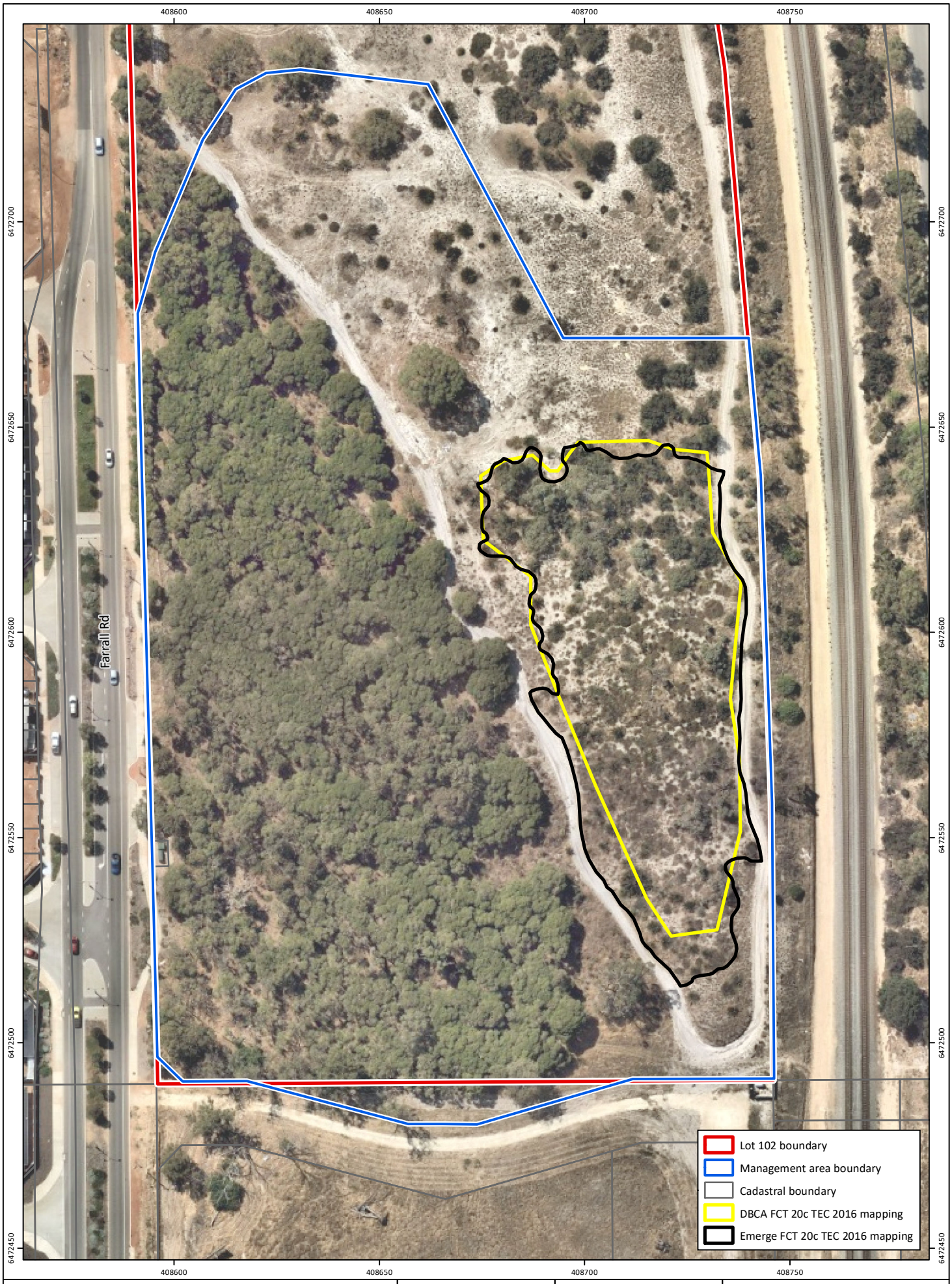

Figure 1: Farrall06 mapping

Project: Supplementary Environmental Report - Response to Submissions
Lot 102 Farrall Road, Midvale

Client: Peet Stratton Pty Ltd

Plan Number: EP16-009(25)--F153

Drawn:	AFF
Date:	8/05/2020
Checked:	TAA
Approved:	CKK
Date:	8/05/2020

N

0 10 20 30
Metres

Scale: 1:1,200@A4

GDA 1994 MGA Zone 50

emerge ASSOCIATES

Appendix A

Regional and Local Statistics for FCT 20c TEC including Farrall05

Table A1 The extent of FCT 20c TEC regionally and locally and the impact of the proposal including Farrall05.

Threatened Ecological Community extent	Extent remaining (ha)	Extent remaining (ha) within 20 km of the site (ha)	Extent within the site (ha)	Area impacted by the proposal (ha)	Impacted area as a % of total	Impacted area as a % of 20 km extent
FCT 20c TEC	129.13	71.86	0.77	0.23	0.18 %	0.32 %

Appendix B

Offset Assessment Guide and parameters (Strategen JBS&G 2020)

Table B1 MNES Protection of retained vegetation offset calculations including Farrall05.

Offset parameter	Values used in calculator	Justification of value
Area of impact (ha)	0.23	0.23 ha of FCT 20c is proposed to be cleared
Quality of impacted area	5	The independent TEC assessment determined that 0.18 ha of the 0.23 ha of FCT 20c proposed to be cleared is in 'completely degraded' to 'degraded' condition, and the remaining 0.05 ha is considered to be in 'good' condition.
Time over which loss is averted	20	The offset area to be retained will be reserved for recreation and vested in the Crown under Section 152 of the *Planning and Development Act 2005,* and handed over to the CoS for future management and conservation.
Time until ecological benefit	1	Ecological benefit would be realised immediately as a direct offset would be provided.
Start quality (retention area)	7	As per the independent TEC assessment conducted by van Etten (2019), the proposed area for retention is considered to be in 'very good' to 'good' condition.
Future quality without offset	3	Given the patch of TEC is small in area and the long-term viability of this vegetation will be comprised as a result of pressures arising from development of the surrounding area, quality of the offset site is likely to decline significantly without any protection and ongoing management measures. As noted in the independent TEC assessment and Section 4.2.3.2, the long-term viability of the TEC will decline irrespective of the proposed development. All patches of FCT 20c within Lot 102 are currently subject to a degree of grassy weed invasion and are likely to transition into a grass-dominated open woodland/shrubland ecosystem. This transition would result in compositional, structural and functional changes such that the patches are no longer identifiable as FCT 20c or are unable to recover from the extent of degradation without substantial intervention.
Future quality with offset	7	The offset area to be retained will also be subject to rehabilitation and revegetation measures to improve the quality of the offset site to a 'good' or better condition. Ongoing management of the offset site will reduce the impacts of weed invasion and reduce the impacts of edge effects resulting from development of the surrounding area.
Risk of loss (%) without offset	10	The site is zoned 'Urban' under the Metropolitan Region Scheme (MRS) and 'Residential Development' under the City of Swan Local Planning Scheme No. 17 and has been identified by the State Government as an important infill site in the eastern corridor as key short-term urban development area. Considering that the site is situated in an area that has been identified for priority development in the short term (i.e. within the next 10 years), it is considered that there is a heightened risk of loss in the absence of the offset to provide a form of protection. Additionally, although the condition of the patch of FCT 20c to be retained has been classified as 'very good' to 'good' this patch is small in area and the long term viability of this vegetation will be comprised as a result of pressures arising from the development of the surrounding area and therefore, likely to result in a significant decline in condition. Measures proposed within the RVMP will ensure that the retention area is managed to prevent a decline in the condition and ecological function of the patch of FCT 20c to be retained.
Risk of loss (%) with offset	5	The offset area to be retained will be reserved and vested in the Crown for future conservation.
Confidence in result (habitat quality)	90	Protection mechanisms, once established, will provide a higher level of certainty that the offset will be conserved. Furthermore, implementation of the CEMP and RVMP will lead to the desired conservation outcomes being achieved. Additionally, the proponent has committed to 5 to 7 years of management prior to handover to the

Offset parameter	Values used in calculator	Justification of value
		CoS for future management, which exceeds the standard commitment of 3 years/2 summers.

Table B2 MNES Revegetation offset calculations including Farrall05.

Offset parameter	Values used in calculator	Justification of value
Area of impact (ha)	0.23	0.23 ha of FCT 20c is proposed to be cleared
Quality of impacted area	5	The independent TEC assessment determined that 0.18 ha of the 0.23 ha of FCT 20c proposed to be cleared is in 'completely degraded' to 'degraded' condition, and the remaining 0.05 ha is considered to be in 'good' condition.
Time over which loss is averted	20	The offset area is anticipated to be reserved for recreation and vested in the Crown under Section 152 of the *Planning and Development Act 2005,* and handed over to the CoS for future management.
Time until ecological benefit	10	Time until ecological benefit is estimated at 10 years. This is an allowance for planted vegetation to become established and monitored for success.
Start quality (revegetation area)	5	The proposed revegetation area around the retained patch of TEC, is in a poor to degraded condition.
Future quality without offset	2	Given the area proposed to be revegetation is in poor to degraded condition, the quality of the revegetation area is expected to decline further without revegetation and management measures due to increasing pressures resulting from development of the surrounding area.
Future quality with offset	7	Revegetation/rehabilitation of the TEC is expected to result in an improvement of condition to 'good' or better. Ongoing management of the TEC will reduce the impacts of weed invasion and reduce the impacts of edge effects resulting from development of the surrounding area.
Risk of loss (%) without offset	10	The site is zoned 'Urban' under the Metropolitan Region Scheme (MRS) and 'Residential Development' under the City of Swan Local Planning Scheme No. 17 and has been identified by the State Government as an important infill site in the eastern corridor as key short-term urban development area. Considering that the site is situated in an area that has been identified for priority development in the short term (i.e. within the next 10 years), it is considered that there is a heightened risk of loss in the absence of the offset to provide a form of protection. Additionally, development of the surrounding area without revegetation/rehabilitation of the TEC, would result in the TEC becoming more susceptible to degrading factors such as weed invasion and edge effects.
Risk of loss (%) with offset	5	Protection of the TEC will ensure that the risk of loss is minimised as much as possible. The TEC will be fenced and actively managed on an ongoing basis. The proponent will be responsible for actions relating to conditions imposed as part of subdivision approval. Ongoing management measures will include weed control, rabbit control (if required) and maintenance of fencing. The proponent has committed to 5 to 7 years of management prior to handover to the CoS for future management, which exceeds the standard commitment of 3 years/2 summers.
Confidence in result (habitat quality)	90	Protection mechanisms, once established, will provide a higher level of certainty that the offset will be conserved. Furthermore, implementation of the CEMP and RVMP will lead to the desired conservation outcomes being achieved. Additionally, the proponent has committed to 5-7 years of management prior to handover to the CoS

Offset parameter	Values used in calculator	Justification of value
		for future management, which exceeds the standard commitment of 3 years/2 summers.

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	FCT 20c
EPBC Act status	Critically Endangered
Annual probability of extinction Based on IUCN category definitions	**6.8%**

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	Yes	TEC FCT 20c	**Area**	0.23	Hectares	Biological surveys Based on 0.03 ha being Completely Degraded to Degraded, 0.15 ha being Degraded condition and 0.05 ha being in Good condition
			Quality	**5**	Scale 0-10	
			Total quantum of impact	0.12	Adjusted hectares	
Threatened species habitat						
Area of habitat	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	Yes	0.12	Adjusted hectares	Onsite retention of 0.54 ha	**Risk-related time horizon (max. 20 years)**	20	**Start area (hectares)**	0.54	**Risk of loss (%) without offset**	10%	**Risk of loss (%) with offset**	5%	0.03	90%	0.02	0.01	0.17	146.42%	Yes	
									Future area without offset (adjusted hectares)	0.5	**Future area with offset (adjusted hectares)**	0.5								
					Time until ecological benefit	1	**Start quality (scale of 0-10)**	**7**	**Future quality without offset (scale of 0-10)**	**3**	**Future quality with offset (scale of 0-10)**	**7**	4.00	90%	3.60	3.37				
Threatened species habitat																				
Area of habitat	No				**Time over which loss is averted (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Threatened species																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

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Matter of National Environmental Significance	
Name	FCT 20c
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Annual probability of extinction Based on IUCN category definitions	**6.8%**

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	Yes	TEC FCT 20c	**Area**	0.23	Hectares	Biological surveys Based on 0.03 ha being Completely Degraded to Degraded, 0.15 ha being Degraded condition and 0.05 ha being in Good condition
			Quality	**5**	Scale 0-10	
			Total quantum of impact	0.12	Adjusted hectares	
Threatened species habitat						
Area of habitat	no		**Area**	55.3		Biological survey
			Quality	**5**		
			Total quantum of impact	27.65		
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	Yes	0.12	Adjusted hectares	Revegetation of 0.44 ha	**Risk-related time horizon (max. 20 years)**	20	**Start area (hectares)**	0.44	**Risk of loss (%) without offset**	10%	**Risk of loss (%) with offset**	5%	0.02	90%	0.02	0.01	0.10	83.49%	No	
									Future area without offset (adjusted hectares)	0.4	**Future area with offset (adjusted hectares)**	0.4								
					Time until ecological benefit	10	**Start quality (scale of 0-10)**	**5**	**Future quality without offset (scale of 0-10)**	**2**	**Future quality with offset (scale of 0-10)**	**7**	5.00	90%	4.50	2.33				
Threatened species habitat																				
Area of habitat	No	27.65			**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	31.1	**Risk of loss (%) without offset**	40%	**Risk of loss (%) with offset**	10%								
									Future area without offset (adjusted hectares)	18.7	**Future area with offset (adjusted hectares)**	28.0		80%						
					Time until ecological benefit	10	**Start quality (scale of 0-10)**	3	**Future quality without offset (scale of 0-10)**	2	**Future quality with offset (scale of 0-10)**	4		80%						
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Threatened species																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			